

WHAT IS CLAIMED IS:

1. A method for automatic focusing onto the surface of a sample, comprises the steps of:
 - illuminating the sample by a measurement light beam that strikes the surface of the sample at an incidence angle differing from 0° ;
 - detecting light reflected from the surface of the sample by means of a position-sensitive receiving surface;
 - allocating intensity values of the reflected light as to positions on the receiving surface are recorded and evaluated;
 - imaging the opening of a field stop onto the receiving surface, thereby generating an image that is smaller than the receiving surface,
 - allocating a value of "light" or "dark" to each intensity value depending on whether it exceeds or falls below a defined brightness threshold;
 - determining a smallest rectangle that encloses all positions on the receiving surface whose intensity value is "light";
 - determining a geometric center point of said rectangle;
 - comparing a position of the geometric center point with a position on the receiving surface that corresponds to the geometric center point of the image generated by the field stop in the focused state; and
 - effecting a change in the distance between the sample and the imaging optical system corresponding to the distance between the two points is.
2. The method as defined in Claim 1, wherein the geometric center point of the rectangle is examined as to whether it lies on a predefined straight line, and if such is not the case, the side ratios of the rectangle are modified so that the geometric center point of the rectangle is shifted onto the straight line.

3. The method as defined in Claim 1, wherein the imaged opening of the field stop has at least one edge formed on the receiving surface the method comprises the additional steps:
 - determining the sharpness of the at least one edge of the image of the field stop, additionally based on the recorded intensities and the locations of the edges of the geometric figure of the field stop;
 - determining a vertical displacement needed to establish maximum sharpness of the image field stop, wherein the needed vertical displacement is based on a comparison of the sharpness with a predefined sharpness criterion, and
 - using said vertical displacement for fine adjustment.
4. The method as defined in Claim 1, wherein the imaged opening of the field stop has at least one edge formed on the receiving surface the method comprises the additional steps:
 - determining the sharpness of the at least one edge of the image of the field stop on the basis of the recorded intensity values;
 - determining a vertical displacement needed to establish maximum sharpness of the image field stop, wherein the needed vertical displacement is based on a comparison of the sharpness with a predefined sharpness criterion, and
 - using said vertical displacement for fine adjustment.